

### **REMARKS**

This paper is responsive to the Non-Final Office Action mailed September 5, 2008. Claims 16-20 and 27-32 are pending in this application. Claims 16, 27-29, and 31 are amended to clarify what is claimed. Claim 32 is canceled. Applicants submit that no new matter is added as support for the amendments exists in the specification and claims as originally filed.

### **Interview Summary**

Applicants thank the Examiner for the courtesy of the interview held on February 19, 2009, with counsel for Applicants. During the interview the rejection under 35 U.S.C. § 103(a) and the related references was discussed.

### **Rejection under 35 U.S.C. § 103(a)**

The present invention generally relates to aqueous phytopathological formulations comprising at least one aminophosphate- or aminophosphonate-type herbicide, at least one betaine-type principal surfactant, and at least one alkylmonoglycoside or alkylpolyglycoside additive.

The Office Action rejects claims 16-20 and 27-32 as obvious under 35 U.S.C. § 103(a) over Sato *et al.* (U.S. Patent No. 5,998,332)("Sato") in view of Koenig *et al.* (WO 01/26469) ("Koenig"). *See* Office Action at 2-3.

According to the Office Action, Sato teaches high concentration glyphosate compositions comprising activity enhancing surfactants such as trialkylbetaines and alkyl glycosides/polyglycosides at amounts ranging from 2 to 25% by weight, with optional additives such as

inorganic salts, and additional active agents such as bialaphos and glufosinate. *See* Office Action at 2. According to the Office Action, Koenig teaches a composition comprising isopropylamine salt of glyphosate and suggests the addition of surfactants including betaine derivatives and alkyl glycosides. *See* Office Action at 2.

Although the Office Action admits that neither Sato nor Koenig teach a composition comprising an isopropylamine salt of glyphosate, trialkyl betaines, alkyletheramines and polyglycosides, the Office Action states that, “it would have been obvious to make the instant composition since the combination of references suggests the composition. One of ordinary skill in the art would have been motivated to combine these references because they disclose components, which are useful for formulating and enhancing the activity of aqueous glyphosate or aminophosphate herbicide compositions.” Office Action at 2-3. Applicants respectfully traverse.

As an initial matter, Applicants note that claim 32 has been canceled, thereby rendering rejection of this claim moot.

### **Primary Considerations**

With regard to the remaining claims, Applicants respectfully submit that the Office Action does not establish a *prima facie* case of obviousness because the references themselves teach away from the claimed formulations.

Sato discloses aqueous herbicidal compositions comprising high concentrations of inorganic ammonium salt of glyphosate together with a surfactant. *See* Sato at col. 1, lines 8-10. Indeed, Sato’s teachings are specific to ammonium salts of glyphosate at the specific pH of 6-7. *See, e.g.*, Sato at Abstract. Sato further teaches that examples of surfactant classes that “may be

useful” are:

alkanolamides,

betaine derivatives,

polyoxyethylene polyoxypropylene block copolymers,

glycerol esters,

glycol esters,

imidazolines and imidazoline derivatives,

lanolin derivatives,

lecithin and derivatives thereof,

alkylamines,

tertiary and quaternary polyoxyalkylene alkylamines,

polyoxyalkylene and non-polyoxyalkylene alkylamine oxides,

tertiary and quaternary polyoxyalkylene alkyletheramines,

polyoxyalkylene alkyletheramine oxides,

polyoxyalkylene alkylethers derived from primary and secondary alcohols,

polyoxyalkylene alkylarylethers,

polyoxyalkylene alkylesters,

alkoxylated and non-alkoxylated sorbitan esters,

alkyl glycosides,

alkyl polyglycosides,

sucrose esters,

sucrose glycerides,

alkyl sulfates and phosphates,

olefin sulfonates,  
alkylaryl sulfonates,  
polyoxyalkylene alkylether sulfates and phosphates,  
sulfosuccinate derivatives,  
sulfosuccinamates, taurates,  
sulfates and sulfonates of oils,  
fatty acids, alcohols,  
alkoxylated alcohols,  
fatty esters and aromatic derivatives,  
mixtures thereof and the like.

Sato at col. 8, lines 12-30.

The examples of Sato employ three different surfactant mixtures, each having three surfactants at various ratios chosen from the list above, none of which is alkylbetaines/alkyl(amidoalkyl)betaines or alkylmonoglycoside/alkylpolyglycosides as presently claimed :

Surfactant Mixture A

65% methyl bis(2-hydroxyethyl) coco ammonium chloride  
15% polyoxyethylene (8) secondary C.sub.12-13 alkanol  
20% diethylene glycol

Surfactant Mixture B

40.7% methyl bis(2-hydroxyethyl) coco ammonium chloride

9.3% polyoxyethylene (7) secondary C.sub.12-13 alkanol

19% diethylene glycol

31% water

Surfactant Mixture C

40-44% methyl bis(2-hydroxyethyl) coco ammonium chloride

9-10% polyoxyethylene (7) secondary C<sub>12-13</sub> alkanol

17-18% diethylene glycol

balance to 100% water

Sato at col. 15, lines 25-47.

Given the nearly “infinite” possible combinations of one, two, three or more surfactants, and the lack of any specific teaching regarding the combinations of surfactants claimed, Sato states, “The choice of surfactant is very important. For example, in an extensive study...Wyrill and Burnside found wide variation among surfactants and their ability to enhance herbicidal efficacy of glyphosate.” Sato at col. 1, lines 63-67 (emphasis added). Sato also discloses that “herbicidal effectiveness of glyphosate salt solutions is highly dependent upon two factors: selecting a suitable surfactant and providing as high a concentration of that surfactant as possible in the concentrate formulation.” Sato at col. 4, lines 7-10. Therefore, Sato teaches both the variability and criticality of surfactant choice yet provides examples of only three surfactant mixtures (which do not employ the presently claimed surfactants) for use with ammonium glyphosate at a specific pH.

As is well established under 35 U.S.C. § 103, a prior art reference must be considered in its entirety. Here, the Office Action divorces the large list of surfactants from the fact that (1)

Sato emphasizes numerous times that the particular selection of surfactant is absolutely critical to the functioning of the composition, and (2) that it is only in the context of a very specific ammonium glyphosate salt that the particular surfactant combinations described by Sato are effective. The present claims are not limited to that specific ammonium glyphosate salt. It is therefore fair to say that one of ordinary skill in the art, at the time of the invention, would not merely have picked from Sato's list of surfactants with a reasonable expectation of obtaining a suitable combination. Indeed, quite the opposite is true.

Koenig teaches that "by mixing the isopropylamine salt of glyphosate with the ammonium salt of glyphosate, particularly in certain ratios, stable compositions can be formulated. *See* Koenig at 2, lines 1-3. Koenig teaches that "the surfactant component may include one or more surfactants," examples of which "may be useful" including:

alkanolamides

betaine derivatives

ethoxylated propoxylated block copolymers,

glycerol esters,

glycol esters,

imidazolines and imidazoline derivatives,

lanoline derivatives,

lecithin derivatives,

tertiary or quaternary polyoxyalkylene alkylamines,

polyoxyalkylene and non-polyoxyalkylene alkylamine oxides,

polyoxyalkylene alkylethers,

polyoxyalkylene alkylarylethers,

alkyl glycosides,  
alkyl polyglycosides,  
sucrose esters,  
sucrose glycerides,  
alkyl sulphates or phosphates,  
olefin sulfonates,  
alkylaryl sulfonates,  
polyalkylene alkylether sulphates or phosphates,  
sulfosuccinate derivatives,  
sulfosuccinamates,  
taurates,  
sulphates and sulfonates of oils,  
fatty acids,  
alcohols,  
alkoxylated alcohols,  
fatty esters,  
aromatic derivatives, and  
mixtures thereof.  
Koenig at 3-4.

Koenig further states that “[w]e have found the properties of the composition are particularly useful when the surfactant includes a phosphate ester.” Koenig at 4, lines 15-16 (emphasis added).

Therefore, Koenig discloses a long list of possible surfactants, one or more of which may

be useful in composition having mixtures of two glyphosate salts in certain ratios, and teaches away from the claimed invention by disclosing that compositions including phosphate esters are preferred.

Applicants submit that as shown by the cited references, the art of the present invention is unpredictable, and the choice of surfactant critical. Yet neither Sato, nor Koenig teaches the specific combination of betaine and polyglycoside surfactants claimed. Indeed, if anything, both Sato and Koenig teach away from the claimed invention by pointing one of skill in the art to surfactants that are not claimed.

Accordingly, Applicants respectfully submit that it would not have been obvious to one of ordinary skill in the art having knowledge of Sato and Koenig to arrive at the subject matter of the instant claims for the simple reasons that 1) the references teach away from the claimed formulations and 2) it would have been an extremely difficult—if not insurmountable—task, for one of ordinary skill in the art to select and test the vast combinations of surfactants taught by Sato and Koenig to arrive at the present invention. Under such circumstances, the claimed compositions cannot be *prima facie* obvious.

### **Secondary Considerations**

Nevertheless, even if the Examiner maintains that a *prima facie* case has been established, Applicants respectfully submit that such case is overcome by the showing of unexpected results set forth below:

### **Experimental Results**

The following stable formulations were prepared. Herbicidal activity was evaluated in green house trials on several weeds 28 days after application of 1 pint/acre of the formulation on



the weeds. The score represents the growth inhibited by the herbicide as an average for all the weeds. (Higher scores are better.)

Example (principal surfactant + additive iv):

- |  |         |
|--|---------|
| - glyphosate isopropylamine salt (as acid equivalent): | 450 g/L |
| - Alkylbetaine - as active %                           | 1.5%    |
| - Alkyl polyglycoside (additive iv) – as active %      | 2.5%    |

**Score: 97**

Comparative Example 1 (ethoxylated amine alone):

- |  |         |
|--|---------|
| - glyphosate isopropylamine salt (as acid equivalent):     | 450 g/L |
| - Tallow amine ethoxylate (additive i alone) - as active % | 10%     |

**Score: 97**

Comparative Example 2 (ethoxylated amine alone):

- |  |         |
|--|---------|
| - glyphosate isopropylamine salt (as acid equivalent): | 450 g/L |
| - Alkylbetaine - as active %                           | 3%      |

**Score: 91**

Comparative Example 3 (ethoxylated amine alone):

- |  |         |
|--|---------|
| - glyphosate isopropylamine salt (as acid equivalent): | 450 g/L |
| - Alkylbetaine - as active %                           | 1.5%    |

**Score: 93**

Comparison of the Example with Comparative Example 1 shows a very high efficacy with much less additive. A score of 97 was achieved with just 4 active % of betaine and polyglycoside surfactants for the Example as compared with 10 active % of tallow amine ethoxylate surfactant for Comparative Example 1. Comparison of the Example and Comparative Examples 2 and 3 shows higher efficacy with the combination of betaine and glycoside surfactants of the Example as opposed to betaine surfactant alone. The use of less additive while maintaining effectiveness is beneficial because it enables lower cost and more eco-friendly

products. Moreover, this result was completely unexpected, as the use of less additive would be expected to result in reduced activity.

Accordingly, Applicants respectfully submit that the subject matter of the present claims is not obvious at least in view of the above showing of unexpected results. Withdrawal of the rejection is respectfully requested.

**Conclusion**

Applicants submit that all claims are in condition for allowance; notice to that effect is hereby solicited. Should any issues remain to be discussed in this application, the examiner is invited to contact the undersigned by telephone.

Respectfully submitted,  
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